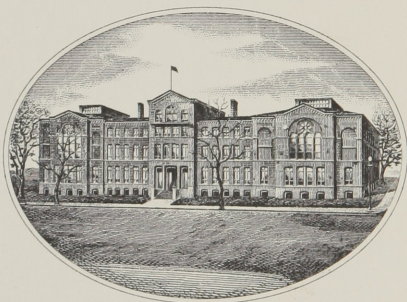


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Public Health Service

A
SEMI-ANNUAL
ORATION,

ON THE
ORIGIN OF PESTILENTIAL DISEASES,

DELIVERED BEFORE

THE ACADEMY OF MEDICINE OF PHILADELPHIA,

On the 17th day of December, 1798.

By CHARLES CALDWELL, A. M. M. D.

Senior Vice-President of the Academy.

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1799.



EXTRACT FROM THE MINUTES OF
THE ACADEMY OF MEDICINE.

December 17th, 1798.

“ RESOLVED, that the thanks of the Academy be
“ presented to DR. CHARLES CALDWELL, for his learned, ele-
“ gant, and ingenious discourse, upon the origin of pestilen-
“ tial diseases, delivered before the Academy this day.”

“ RESOLVED, that DR. CALDWELL be requested
“ to furnish a copy of it for immediate publication.”

JOHN C. OTTO, Sec'ry.

TO THE PRESIDENT AND MEMBERS OF THE
ACADEMY OF MEDICINE OF PHILADELPHIA.

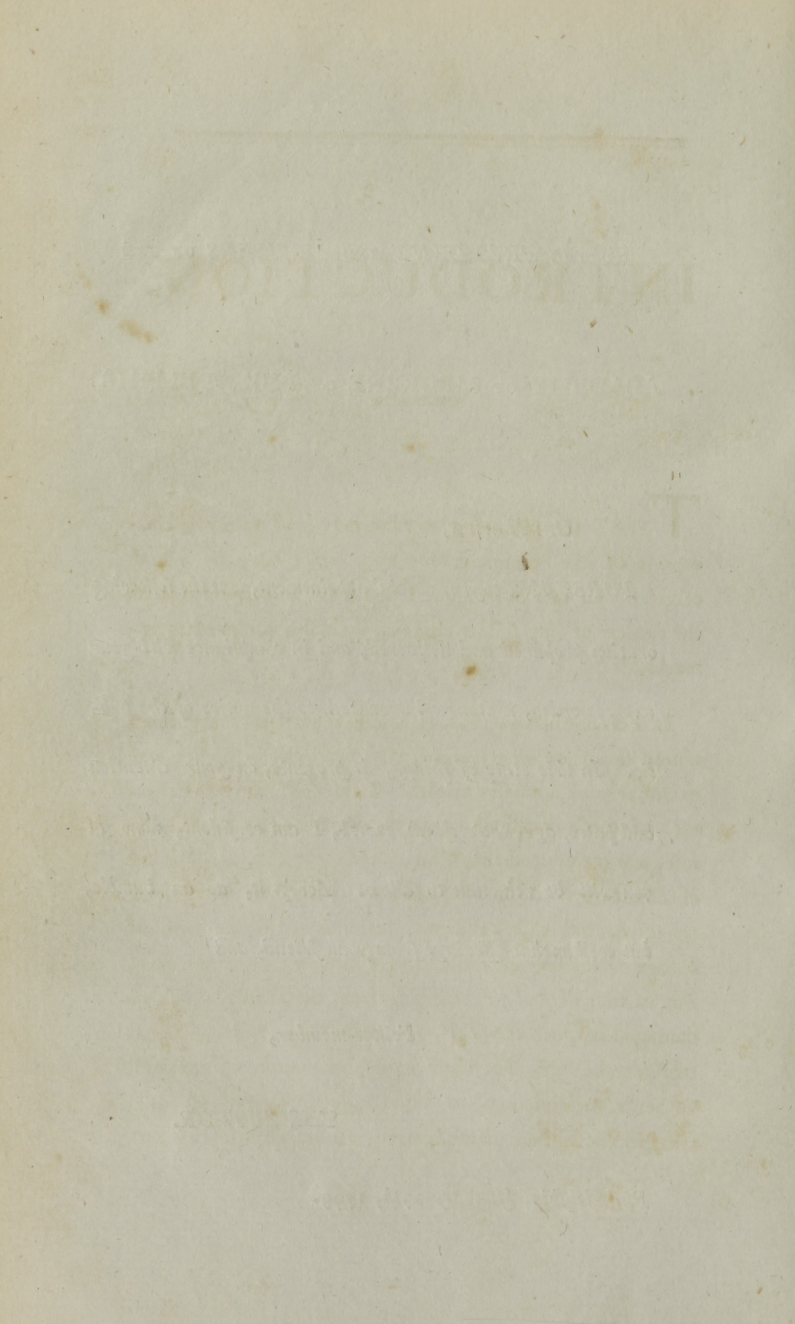
GENTLEMEN,

PURSUANT to your special appointment, was the following oration prepared and delivered, and in compliance with your express order, is it now introduced to the notice of the public. In this state of things, it presents, on your attention and patronage, that claim, which, I am confident, none of you will be reluctant to allow. Accept it, as an humble, but well meant offering, from your friend, and

Fellow-member,

THE AUTHOR.

Philadelphia, January 27th, 1799.



INTRODUCTION.

THAT the following oration may lead to no misconception of the opinion I entertain, respecting the actual origin of our late epidemics, I beg leave to introduce it to the notice of my fellow-citizens, by a few preliminary remarks.

I. I do not believe that, either, in the years ninety three, ninety seven, or ninety eight, the American pestilence was exclusively of domestic origin. I am persuaded that, on each of those occasions, a very powerful cause of this disease, was introduced into Philadelphia, through the channel of commerce. I do not, however, with some physicians, conceive, that this cause was introduced in the form of *human contagion*, generated in the diseased bodies of men, but in that of *foul air*, resulting from the putrid ballast, or damaged cargoes of vessels. Nor have I, on enquiry, found reason to believe, that there exists, on record, a single well authenticated instance, of the disease in question, having, ever, in the former method, been introduced into any part

of the United States. As often as commerce has borne a part in giving birth to this disease, in any of our seaports, it does not appear to have been through the instrumentality of *human contagion*, imported from the East or West Indies, from the Levant, or the shores of Africa; but, as lately in this place, through that of pestiferous air, generated by the putrefactive dissolution of the cargoes or ballast of vessels at sea. Nor is it a matter of the smallest import, from what quarter of the globe these cargoes come. Provided, they be of a putrefiable nature, and arrive in our ports, during the intensity of our summer heats, (but, particularly, between the middle of July and last of September,) it is wholly immaterial whether they be the native productions of Europe, of Asia, of Africa, or of the West India Islands. And it is equally immaterial, from which of those places they are immediately imported. The suspension, therefore, of commercial intercourse, during certain months in the year, with the West India Islands alone, would be a measure wholly inadequate to the prevention of this disease. Were such suspension adopted by the Government of the Union, it should, unquestionably, extend to all parts of the globe, from which putrefiable cargoes may be imported. But such an impolitic measure, suggests at once sufficient cause for its immediate rejection, as it is evidently pregnant with nothing less than absolute ruin to the commerce of our country.

II. I have not found sufficient cause to believe, that, without the co-operation of foul air, from the vessels at our wharves, the American pestilence would have become

epidemic, in our city, in either of the years, to which I have alluded. I have even gone so far as to flatter myself, with a belief, that, in the present state of our city, such co-operation is absolutely necessary to its epidemic prevalence. In this belief, however, I am, by no means, confirmed. Perhaps, even now, the filth of our city and suburbs has accumulated to a sufficient height, to give to pestilence an epidemic rage. In ninety three, I had not completed my medical studies, and can, therefore, say nothing respecting the immediate source of particular cases, that might have occurred in the city during that year. But I hesitate not to say, with as much confidence, as I ought to use, in speaking on any speculative subject in physics, that, in ninety seven and ninety eight, I saw, myself, several cases of the disease in question, which must have necessarily resulted from the operation of domestic causes. I am further confident, that many cases of a similar nature, were attended by some of my medical friends. If, then, from the present sources of our city, solitary, or (to speak in medical language) sporadic cases of pestilence may now occur, how melancholy is our prospect, should the filth in our city and suburbs, be suffered to accumulate with the progress of time! Of such an accumulation must not an epidemic be finally the offspring?

But let us, even, for a moment, admit, that not a single case of the epidemics of ninety three, ninety seven, or ninety eight, originated from the exclusive operation of domestic causes. Still, it is a position, which no one will venture

to deny, that their rapid and extensive propagation, was effected by some peculiarity in the atmosphere of our city. This inference we draw from the *very few* instances, in which, the pestilence, under consideration, was propagated by contagion when taken from the city to the unadulterated atmosphere of the country.

Were the atmosphere of Philadelphia preserved in purity, by a due degree of attention to domestic cleanliness, and by preventing vessels, charged with foul air, from entering our port, pestilence, as an epidemic, would never again occur, to swell the catalogue of our future misfortunes.— In such a state of things, sporadic cases of the disease might, *possibly*, originate with ourselves, and might, unquestionably, be introduced from distant places; but the evil would terminate with the death or recovery of those first attacked, and would never spread, to the distress of our citizens, and the depopulation of our city. The baleful plant, though fairly ingrafted on our systems, would languish, wither, and die for want of nourishment!

III. Thus, whatever principles, I may advocate, with respect to the practicability of pestilence originating and existing, as an epidemic, in our city, under certain circumstances, from the exclusive operation of domestic causes, I believe this to be an event, which has never yet occurred. Commerce appears to have been, at all times, justly chargeable with part of the calamity, that has never failed, to accompany this worst of evils. The epidemic train would seem to have been, always, laid in our atmosphere, by the ac-

tion of the summer-fun on the filth of our city and suburbs, while immense volumes of foul air, discharged from the holds of vessels at our wharves, served as the spark to rouse it into flame. Had not the train existed, the spark would have expired without effect, and had not the spark been applied, the train would have lain dormant, and, perhaps never burst into actual explosion—If, then, by the destruction of either of these, we might acquire an exemption from the inevitable effects of their co-operation, by the removal of the one, and the prevention of the other, we become doubly secure against the calamities, to which they give origin.

I hope I will be indulged in attempting, by another analogy, a farther illustration of the above intricate and interesting subject. With this view, I would compare the summer atmosphere of our city, deeply contaminated by putrid exhalations from domestic sources, to a mass of paste or dough, duly kneaded, and prepared to undergo the process of fermentation. In this state of things, the yeast, or leaven, calculated and intended to give actual birth to this process, not unfitly represents the foul air issuing from the holds of vessels at our wharves, and mixing, in abundance, with our vitiated atmosphere. As the operation of the ferment is well known to be, that of assimilating to itself, the mass into which it is introduced, such would seem to be the effect of the deleterious air discharged along our wharves. It communicates to the atmosphere of our city, *perhaps*, by a peculiar species of fermentation, its own pestilential and

destructive properties. Or, like the matter of the small-pox, introduced into a system predisposed to its reception, it inoculates our atmosphere with effect, and thus, *possibly*, by an indescribable species of sympathetic action, approximates to its own nature, the air that surrounds us.

If we pay due attention to all the branches of domestic cleanliness, and keep foul vessels at a distance from our wharves, war may rage in the West-Indies,* till the passions of man begin to languish, and the ambition of nations become exhausted, and the yellow-fever may there spread desolation from island to island, yet, still, amid this deplorable wreck and confusion, will our city remain exempt from an epidemic pestilence ! Whereas, on the other hand, if these requisites be not attended to,—if our city and suburbs be suffered to continue immersed in their present filth, and vessels be allowed to disembogue their pestilential vapours along our wharves, though the West Indies should be converted into an Eden of peace, fragrance, and healthfulness, and though the seeds of pestilence, should be, for ever, blasted along the shores of Asia, and Africa, yet still, will Philadelphia—hapless Philadelphia, remain subject to a reiteration of the melancholy scenes of ninety three, ninety seven, and ninety eight !

** Of all the explications, which have been hitherto given for the existence of our late epidemics, none has appeared to me, so completely the child of fancy, as that, which attributes it to the prevalence of war in the West Indies. For my own part, I must confess, I am not able to discover any more necessary physical connection between war in the West Indies, and pestilence in America, than between coach-making in Philadelphia, and button-making in London !*

A

SEMI-ANNUAL

ORATION, &c.

MR. PRESIDENT AND GENTLEMEN,

I N rising to address you on the present occasion, my feelings impel me to a two-fold acknowledgment—An acknowledgment for the unexpected honour, with which I have been distinguished, in your appointing me to prepare and deliver the first of the semiannual addresses enjoined by our constitution; and a most cordial acknowledgment for the liberal indulgence, which I experienced from you, on a former occasion, when indisposition interfered, and, by frustrating my attempt to comply with my engagement, disappointed, for the time, the expectations of the Academy.

Would that I could suffer my exordium to terminate here! But circumstances forbid that this should be the case. The pleasure of *acknowledgment* I must now exchange for the task of *apology*.

In behalf of the following performance, I would address myself, not to that rigid, unaccommodating justice in criticism, which I have reason to believe most of you have at command, but to that forbearance and clemency, of which, I, am well assured, you are all possessed. I must solicit you to extend to the subsequent oration, some share of that partiality, with which, on various occasions, you have honoured the Orator. Let me not be disappointed in flattering myself, that the usual benevolence of your natures will throw, at least, some shadow of palliation over such faults as the clearness of your understandings will inevitably discover, and the justness of your sentiments oblige you to condemn.

Suffer it to operate in mitigation of your impending sentence, when I assure you, that the following address was prepared amid numerous avocations, of a nature more than usually unfavourable to success in composition. But satisfied that I have more—much more, to expect from the ingenuous liberality of your minds, than from the humble merit of my own defence, I will no longer address you in the language of apology. Part of the imperfections of the oration I am about to deliver, arise no less from want of abilities, than from want of leisure. A portion of the censure must, therefore, in justice, rest on yourselves, for not having been more circumspect in your choice of an orator.

It was my intention to have paid in this place, a passing tribute to the memory of our two deceased friends and fellow-members, Dr. Sayre and Dr. Cooper. I had even prepared

myself for the discharge of this mournful duty. Impressed by respect for the talents and learning, and by sentiments of esteem and friendship for the numerous virtues of those two medical philosophers, I was unwilling to neglect so fair an opportunity of expressing my sense of their distinguished worth. Being superceded however, in this duty, by a very judicious and respectful appointment of the Academy, for the express purpose of doing justice to their memories, I shall pass in silence over the melancholy subject. But when the name of Cooper, in particular, is mentioned, to suffer oblivious silence to usurp the place of descriptive and just eulogium, is, with me, no inconsiderable effort of self-restraint. On such an occasion my feelings would prompt me to a far different conduct. As I have ever ranked the acquisition of the friendship of this gentleman among the most fortunate occurrences of my life, it will not be thought strange, that I should feel an inclination to contribute my mite to the immense treasure of respect, which his numerous acquaintance will pay to his memory. But an indulgence of my feelings on this occasion, would lead to an unwarrantable digression from what I propose as the immediate subject of my address.

Instead of attempting, therefore, to cherish in your breasts a kind, but unavailing sorrow for the dead, allow me to solicit your attention to a few general observations relative to the origin of pestilential diseases. I shall afterwards confine my remarks and speculations more immediately to the origin of that disease, whose ravages and con-

comitant terrors, have thrice, of late, reduced the gay and crowded streets of our city to a dismal scene of desolation and solitude.

As my subject is, evidently, very extensive and copious, should I even engross a little more of your time than you at present anticipate, I hope you will bear, with a patient indulgence, the unintentional but unavoidable trespass.

It is, in this place, worthy of remark, that *Pestilence* has been, at all times, treated by the world, as an illegitimate child, without an acknowledged parent—in other words, as a plant perfectly exotic as to every inhabited soil and climate—or as a physical evil, existing in almost every region, yet (strange inconsistency !) originating in none !

It is a fact not more singular than true, that, there is not to be found in the whole range of the globe, a single country, which is acknowledged by its own inhabitants, to be the immediate birth-place of pestilence. When this dreadful scourge makes its appearance in any place, however favourable, from climate and local causes, to its domestic generation, its existence never fails to be attributed either to *introduction* by land, or *importation* by sea, from some foreign country. As it, for the most part, appears first in large commercial cities, the latter of these is most commonly considered as the channel of its conveyance. Hence the evils of pestilence have been generally charged to the account of commerce. Thus, when the plague prevails in

any part of Europe, it is uniformly asserted to have been imported in merchandize from Asia. When it breaks out in the latter place, where it not unfrequently depopulates towns and villages, and, occasionally, lays even whole countries waste, it is always traced, or what, with the indolent and unthinking natives, amounts to the same thing, is supposed to be traced to some communication with the continent of Africa. But the hardy sons of this burning climate, spurn, with indignation, what they consider not only as an insult to the healthfulness, but also as an injury to the prosperity of their country, and contend, that the plague is never generated with them, but is always introduced from some distant quarter. Nor is this obstinate spirit of reluctance in the human race to admit pestilence to be a native of the same soil and climate with themselves, confined to the continent of the old world. But five years ago, the same thing might have been said with respect to most of the inhabitants of the United States. Few of them could then be induced to believe, that the western shores of the Atlantic could possibly give birth to a pestilential disease. They seemed to suppose, that a physical evil of such a magnitude, must necessarily be the growth of a foreign climate, not so highly favoured by heaven as their own.

To you, Gentlemen, it is scarcely necessary for me to observe, that this unwillingness in mankind to acknowledge pestilence to be a native of the same country with themselves, should be viewed as an inveterate prejudice, sup-

ported, like all other prejudices, by the two gothic pillars of *ignorance* and *error*. It requires no uncommon depth of logic to prove, that pestilential diseases, having an existence, must have also a place of origin ; and, that this place, must be in some of the inhabited parts of the earth. But so extraordinary and absurd is the prejudice, of which I have spoken, that it literally denies these diseases to have originated in any place. Taking the sentiments of mankind, on this subject, for our guide, we would find a search after the real birth-place of pestilence equally abortive with the poet's search after the North, which he so energetically represents in the following lines.

"But where th' extreme of vice was ne'er agreed ;
 "Ask, Where's the North ? at York 'tis on the Tweed ;
 "In Scotland, at the Orcades, and there,
 "At Greenland, Zembla, or the Lord knows where !"

So it is with respect to the birth-place of pestilence. In America it is in the West-Indies ; in the West-Indies, it is, at one time, at Siam in the East-Indies ; and again at Boulam in Africa ; while, at these places, it is still farther to the east as if the rising was capable of exalting the poison of putrefaction to higher malignity than even the mid-day sun. Were not the subject too serious to be treated as a jest, I would farther say, that this singular absurdity, in most men, with respect to the birth-place of pestilence, brings to my recollection the humorous story of Goldsmith's pauper, who, in quest of the real or acknowledged place of his birth,

(the place where, by the municipal regulations of his country, he was entitled to a subsistence for life,) was carted about from parish to parish, till, to use the poor fellow's own words, he "thought in his soul, they would not allow that he had been born in any parish at all."

Let us, for a moment, trace this prejudice through all its windings to its fountain head. It springs from the bosom of *self-love*. This real though secret principle of all our sentiments, opinions, and actions, will not suffer us to admit, that we ourselves can be the source of any thing evil, or of any thing disastrous. From ourselves we are inclined to extend this favourable opinion to our friends, acquaintance, and countrymen; and from them, to the air which we breathe, the soil which gave us birth, and even to the waters which variegate the landscapes that surround us. The same selfish principles—the same contracted spirit, which led the reprobate Jews of old to exclaim, "Can any thing good come out of Galilee" induces the more favoured, but, in some respects, not much more enlightened, moderns to ask, can any thing evil originate in our beloved country?

This prejudice, respecting the origin of pestilential diseases, derives no inconsiderable support from the operation of a narrow but powerful principle of self-interest. We are apprehensive, that should our country be characterized as the birth-place of pestilence, such an opinion would

prove injurious to its population and prosperity, and that, consequently our interests as individuals must suffer. This however, is a mistaken fear. General *truth* and general *utility* are sworn friends, and inseparable companions. Nor are they more so, in any instance, than in that which claims our present attention. The same enlightened views in science which declare, that pestilence may originate among ourselves, afford us, at the same time, the most firm and consolatory assurance, that we have in our own hands the means of prevention and safety. Nor is this our only consolation. Were physical truth, on this subject, fully evolved, it would set most, if not all countries and climates, nearly on a level with respect to the origin of pestilential diseases. For I am persuaded that there exists not a spot on the surface of the globe, which may not, under certain, circumstances, become capable of giving birth to these wasteful epidemics.

I beg it may not, from the foregoing observations, be understood, that I mean, on the subject of the origin of pestilential diseases, to accuse the whole human race of ignorance and error. Far from it—There have, at all times, existed many distinguished instances of exemption from such a charge. There have, in all ages, and in all countries, existed men, who, in opposition to an overbearing torrent of popular prejudice and indignation, have boldly maintained the diseases in question to have been the offspring of the places where they have spread desolation.

This is well known to have been formerly the case, in London and Marseilles, during the unparalleled calamities inflicted by pestilence on those two ancient and populous cities. Nor was it of late, less remarkably the case in different parts of the United States, but more particularly in the city of Philadelphia. When the Yellow Fever (which might with more propriety have been denominated the *American pestilence*) made its appearance in this city in the autumn of ninety three, to have said that it was a disease of domestic origin, was considered as an unfounded slander on our climate, and the man, who dared to advocate such an opinion, was viewed in the light of an enemy to his country. Almost every mind was then big with the idea of importation, and almost every eye fixed on a tropical region, as the only place capable of giving birth to such an irresistible malady. To this blindfold state of the public mind, there fortunately existed some degree of exception. Amid the general gloom of ignorance and error, by which we were overshadowed, there appeared, even then, a few twinkling stars, the joyous harbingers of a brighter day. The dawn of that day has already reached us, and we have every reason to believe, that we will very shortly be wrapt in its full meridian.

The opinion, that our late epidemic must be necessarily imported to us from a tropical climate, will soon become as unpopular as it was once extensive. Already is it greatly circumscribed in its limits—Already is it confined almost entirely to those, who were originally active and clamorous

in its support. By such characters we are not to expect that it will be immediately abandoned. They have already pledged themselves to the world for its support, and consider, therefore, its fate as in some measure interwoven with the fate of their own characters, as philosophers in medicine. Like a parent, with all his tenderness awakened by the approaching dissolution of a beloved child, they will cling to it with the greater fondness, the more nearly they see it about to expire. But expire it will, nor can all the partial and studied efforts of its supporters prolong its fleeting existence. Like the *old* system of chemistry tottering before the *new*, it must finally sink beneath the doctrine of domestic generation, nor will it find, among all its advocates, a Priestly to appear great and unshaken in the midst of its ruins!

We have already observed, that in all parts of the world, and in all periods of society, mankind, in general, have entertained and exhibited a most profound hostility against the opinion of their own country being, under any circumstances, the birth-place of pestilence. Nor has the matter ended here. They have been solicitous and active to defend, not only their own immediate country, but even our whole globe, from the charge of giving origin to an evil of such magnitude. Whenever this disease has appeared, they have, like many physicians and citizens of the United States, been extremely anxious and industrious to trace it to some particular species of importation. It may not be altogether useless nor uninteresting, to trace the many singular and ab-

furd modifications, through which this opinion, of the *foreign importation* of pestilential diseases, has successively passed.

In the earliest ages of the world, when ignorance and superstition led men to attribute all extraordinary phenomena to the direct agency of supernatural beings, pestilence was supposed to be imported immediately from Heaven. This is the opinion which appears to have prevailed among the ancient Hebrews, and may be ranked at the head of the catalogue of absurdities on this subject. The dominion of prejudice over the minds of that ignorant and obstinate people, appears in this instance particularly striking. Such was the depth of their blind bigotry in favour of the healthfulness of the globe they inhabited, that they would seem to have considered it as even superior to that of the celestial regions. Hence, unwilling, to believe that their favourite earth could give origin to an evil so dreadful as pestilence, they imported the seeds of this calamity from the more unhealthful climate of heaven!!

Another species of *importation* no less extraordinary than the former, is that which derived pestilential diseases from the sun. An opinion of this kind appears to have been entertained, respecting the origin of that pestilence, which desolated the Grecian camp before the walls of Troy.

Another description of importation from distant worlds remains yet to be mentioned. During that period of error,

in which the science of medicine, in common with most other branches of science, was deeply perverted by astrological notions, not one of the planets (our own perhaps excepted!) escaped the charge of giving origin to pestilential diseases. Thus Saturn, Jupiter, Mars, Venus, and Mercury, may all be found arraigned in the dark catalogue. Nor did the moon herself escape. Even the celebrated, but fanciful Paracelsus, boldly accused this fair luminary, as being the parent of deadly pestilence.—Had nature, previously to this period of intellectual perversion, by a happy effort, raised up a Herschel, to soar, an astronomical Columbus, through the immensity of space, there is little doubt, but that the orb, which now bears his name, would, even from its distant bourne, have been called to the narrow bar of human prejudice, to answer to the charge of having been the birth-place and nursery of the same disease!

In support of the foregoing opinions, however irrational and absurd in the view of a more enlightened age, our remote ancestors appear to have acted in concert. Such was their blind partiality in favour of the world they inhabited, that they could not, for a moment, admit the belief of its ever giving rise to true pestilence. At length, however, were they forced to abandon the ground they had originally taken—At length was this extraordinary metastasis of error obliged to relinquish entirely the heavenly bodies, and fix on earth as its final retreat. At this period men became divided in their opinion, respecting the origin of the evil in question. Obligated to acknowledge it as a native of our

own globe, they commenced a zealous search for the particular soil and climate from which it sprang. Here it was that their opinions became hostile. Each one desirous of preserving, in purity, the character of his own country, charged the birth of pestilence to the country of another. Nor has the controversy as yet subsided. We have seen very evident traces of it in the researches of men after the origin of that malignant pestilence, by which we have, lately, been three times visited. Thus, in America, the West India Islands were, at first, considered as its birth-place. Some physicians, in the West Indies, on the other hand, attribute its prevalence there to importation from the coast of Africa. While, no doubt, the hardy African will retort the charge, and say, that they are indebted, for this disease, to the lawless intrusion of white men on their peaceful shores. Thus we see that the same illiberal spirit of prejudice which, in the earlier ages of the world, induced our forefathers to attribute the origin of pestilence to heaven, to the sun, the moon, and the various planetary bodies, still continues, though under a different form, among their more highly favoured posterity. They went to distant worlds in quest of the origin of this disease, whereas we rest satisfied with shorter excursions, and travel only to distant countries !

I have called that prejudice, which leads to remote parts of the globe, in quest of the origin of pestilential diseases, an illiberal one ; nor am I at all inclined to retract the epithet. I think it narrow and illiberal, because it frequently urges



men on to defend the character of their own climate and country, at the expence of that of other places, which nature has favoured with equal advantages. As formerly observed, the very same principle of illiberality which leads us to deny, to other portions of the globe, the possession of advantages and excellencies which they undoubtedly hold, induces us also to load them with the imputation of evils, from which they are wholly exempt. This is a principle which the enlightened Americans should indignantly renounce. From its undue operation, in the minds of Europeans, they themselves have already suffered much. There was a time when America was considered, by most Europeans, as capable of giving birth to but little that was valuable. And shall we, now, actuated by the same narrow principle, and governed by the same circumscribed views, contend, that it can give origin to nothing embraced in the catalogue of evils? I flatter myself with a confidence that we never will. For though proud and happy in the belief, that the wisdom and spirit of Americans will be at all times competent and prompt to defend our country and its character from every description of insult and injustice, I should yet be sorry and humiliated at the appearance of a selfish national spirit, inclining us to the defamation of other countries, for the illiberal purpose of adding a superior lustre to our own !

From arguments to be laid before you in a subsequent part of this address, it will I trust appear, that America is,

equally with other parts of the world, capable of giving birth to the worst of diseases.

With respect to the opinion, that our late pestilence is necessarily imported from the West Indies, it is with pleasure I observe, that its relinquishment has already very evidently commenced. Even some of its most strenuous advocates have found it necessary, in attempting its defence, to abandon entirely their original ground. They, at first, contended that the seeds of this disease were imported to us in the form of *human contagion* only, adhering to the clothes or bodies of seamen or passengers, or to the timbers, apparel, or contents of vessels. This however, constitutes no longer an article in their medical creed. They are now willing to allow, that the seeds of the disease may be brought, not only under the form of *human contagion*, but also under that of *foul air*, produced by a high state of putrefaction in the vessel's ballast or cargo. This must be granted by all, to be a very *material*, and you will indulge me in adding, a very *auspicious* change of opinion. But the change will not stop here. Having so far relinquished their original ground as to allow, that the *American Pestilence* can originate from putrefaction in the hold of a vessel at sea, they will next accede to the proposition, that it may, under certain circumstances, result from a similar process on shore. Hence the warmer regions of North America will, in all probability, be next suspected of giving birth to the formidable disease in question. But at this point opinion will not remain stationary. The change will still continue to progress,

till, at length, when the shades of error and prejudice shall have been entirely dissipated, each citizen of Philadelphia will see the principal cause of the pestilence that afflicts him, not in the immediate hand of a benevolent Deity—not in the malign aspect of the sun, the moon, or the planetary bodies—not on the burning shores of Africa or the West Indies, but in the very centre of his own city!

Indulge me, for a few moments, in a detail of the leading arguments, which induce me to consider our pestilential diseases as the genuine offspring of our own country.

Pestilence can become epidemic only, when aided by a concurrent constitution of Atmosphere. This position is founded on the collective experience of ages. Where such a constitution does not prevail, sporadic cases of pestilence may indeed occur, but they will again disappear, and leave surrounding individuals unhurt. The nature of that peculiar state of atmosphere, favourable to the propagation of pestilential diseases, has hitherto eluded the researches of philosophers. The reality of its existence, however, is sufficiently established from the obvious effects to which it gives rise. Though ridiculed, of late, by some physicians, under the denomination of an *occult* quality, reason and observation still declare it to be a quality resting, for the certainty of its existence, on evidence as substantial, as that which supports the great Newtonian principle, the gravitation of all terrestrial bodies.

A pestilential constitution of atmosphere may be either *general* or *local*. The general is that which extends over whole countries, sometimes even over entire continents, and, for the most part, prolongs its duration for several successive years. The local is confined to particular spots, most commonly to large commercial cities, and terminates with the disappearance of certain topical causes, which generally possess but a short lived existence.

Various opinions have been entertained, by philosophers, respecting the cause of this general pestilential constitution. By some, it has been attributed to a general and permanent exhalation, perhaps of a mineral nature, resulting from the action of subterraneous fires; by others, to an immense volume of poisonous gas, forcibly discharged from the bowels of the earth, during the dreadful convulsions of an earthquake; and by others again, to torrents of pestiferous air ejected into the atmosphere from the craters of Volcanos. In support of these two latter opinions, some degree of evidence is derived from the circumstance of the prevalence of pestilence, being very often either preceded or accompanied by the occurrence of earth-quakes, or by repeated and dreadful volcanic eruptions. Of the frequent and striking coincidence, both in point of time and place, between the existence of pestilence and the occurrence of earth-quakes and eruptions from volcanos, the records of medicine afford ample proof. An unanswerable argument in favour of the reality of this general constitution of atmosphere, is derived from the frequent (I had almost said uniform) cotemporary

prevalence of pestilential diseases, in different and distant parts of the globe.

That such a general constitution of atmosphere may exist in America, as well as in other places, is a position, which, abstractly considered, we have no reason to doubt. And that it even does actually prevail, at this time, is an opinion entertained by many respectable characters, and supported by various physical phenomena. On a full and minute statement of these phenomena, time will not suffer me, at present, to enter. I flatter myself, however, that the following facts, relative to this curious and interesting subject, will not be deemed unworthy the attention of the Academy.

For some years past, several species of insects, whose existence is known to be intimately connected with the state of the atmosphere, have been more than usually abundant in our country. Of the truth of this, our farmers are able to furnish us with but too many unequivocal and, to them, expensive testimonies. It will require many years to obliterate from the memory of this useful and respectable class of our fellow-citizens, the injuries they have sustained from the invasion and ravages of the *Hessian Fly*.

The origin of this destructive insect has, like that of our late epidemic, constituted a subject of speculation and doubt, among the literary characters of the United States. While some have traced it to foreign importation, others have contended that it is a native of our own country. Were I to lay

before you the result of my own enquiries and reflection on this point of natural history, I should be inclined to advocate the latter opinion. I am rather disposed to believe, that what is vulgarly denominated the Hessian Fly originates entirely with ourselves. There is reason to suspect, that our fields and forests contain, perhaps, at all times, this insect in certain numbers, and that it superabounds, and, depredates on the labours of the husbandman in those seasons only, during which there prevails a state or constitution of atmosphere, more peculiarly favourable to its propagation and existence. For it is a fact well known to naturalists, that no less in the œconomy of insects than in that of plants, certain seasons are favourable, and others unfavourable to their generation and growth.

Again, it is a fact, with which men of observation, cannot be unacquainted, that for several years past, but more particularly during the last and preceding autumns, muskitos were more than usually abundant in those situations which they generally infest—Nor is this all—These insects, not willing to be confined, during the two last seasons, to their former limits, made their way into many places, which, before, had been almost wholly exempt from their invasion. But from the well known circumstance, that muskitos uniformly abound at the same time, and in the same places, with epidemic bilious fevers, we are very fairly authorized to conclude, that these noxious insects depend, for their existence, on an insalubrious state and constitution of atmosphere. Nor must I here omit to observe, that the immen-

city of grass-hoppers, which infested our country, during last summer, bespoke a condition of atmosphere different from what usually prevails at that season.

If then our country has, of late, been characterized by an unusual prevalence of insects and of disease in different places, and if these insects and disease have, in most instances, prevailed, not only at the same time, but also in the same situations, (both of which facts are unquestionably true) have we not, at least, a very ostensible ground of belief, that these unusual and cotemporary phenomena proceed from the same cause, and that this cause is no other than a state and constitution of our atmosphere, different from those that usually characterize the atmosphere of our country?

In corroboration of the preceding inference, namely, that the same constitution of atmosphere, which favours the prevalence of pestilential diseases, is, in like manner, favourable to the existence of insects, I beg leave to give a brief statement and explanation of an interesting fact, which, we learn from the history of former ages. For more than fifty years, during the reign of the emperor Justinian, the plague raged in Europe, Asia and Africa, with such unparalleled violence and malignity, as sometimes to threaten, in appearance, even the depopulation of the whole earth. Throughout this period of devastation and calamity, such was the immensity of locusts which infested the countries where the pestilence prevailed, that many were disposed to attribute the existence of this disease to the death and pu-

trefaction of these destructive insects. This latter opinion, however, we conceive to be founded, in a great measure, in error. For although the pestilential constitution of atmosphere was, no doubt, strengthened by the deleterious gas, arising from the putrefactive dissolution of such an immense volume of animal matter, it is by no means likely that it resulted from this as its primary cause. There exists certain facts which render it much more probable, that the same constitution of atmosphere, resulting originally from some more powerful source, proved favourable, at once, to the generation of locusts, and to the birth and propagation of the pestilence of the age.

Might not a like physical explanation be given of the cause of several of the plagues, which sacred writ declares to have visited, in ancient times, the incorrigible Egyptians; and which were then supposed, to have been inflicted by the immediate hand of the Deity? I allude particularly to the destructive swarms of locusts, and flies, and to the pestilence among men, and the murrain among cattle, two diseases, which appear to be intimately connected. Is it not, I say, at least, an admissible conjecture, that there prevailed, at that time, a certain pestilential constitution of atmosphere, which operated as the leading physical cause of all these evils? The profound darkness which, shortly afterwards, overshadowed, for a time, the dominions of the impious and tyrannical Pharaoh, was probably nothing more than a natural concomitant of the same constitution.

That there was something peculiar and uncommon, in the general state and condition of the air, during our epidemics of ninety three, ninety seven, and ninety eight, we would deduce from the vast number of fiery meteors, (commonly denominated falling or shooting stars) which appeared in our atmosphere during those periods. I think it highly probable, that these blazing meteors, always abound during the existence of a pestilential constitution of atmosphere, and that on their uniform appearance, superstition has erected a belief, that certain strange and supernatural phenomena in the heavens, never fail to give premonition of the approach of pestilence.

As a farther evidence in favour of the existence of a peculiar constitution of atmosphere, particularly during the years ninety three and ninety eight, it deserves to be mentioned, that, in those years, the fruits of our country, in general, ripened and rotted with much more than their usual rapidity. And that, on many of our fruit trees, second crops of blossoms appeared early in the autumn of the same years, and, on some of them, even second crops of fruit made considerable advances toward maturity. Nor could the occurrence of these phenomena be fairly deduced from the existence of any peculiarity in the sensible qualities of the atmosphere. Seasons as warm and dry as those, to which I have referred, are not uniformly productive of similar effects. To the agency, therefore, of some imperceptible cause in our atmosphere, must we attribute the several phenomena in question.

Another unanswerable argument in favour of the occasional existence of a general morbid constitution of atmosphere in our country, is derived from the extensive prevalence of the catarrhal fever (commonly denominated influenza) in the years eighty eight and eighty nine. This disease, which I believe is acknowledged by all to have resulted from a certain deleterious constitution or state of the air we inspired, was so general, as to pervade every part of the United States. But the constitution, from which it originated, must have been, in like manner, general, being necessarily co-extensive with the disease itself. During part of the continuance of this catarrhal constitution, a deep duskiness, or want of due transparency in the atmosphere, considerably obscured the sun, in many, if not most, parts of our country, thus constituting an approach toward Egyptian darkness, which, as formerly observed, was, probably, nothing more than a natural effect or concomitant of the then existing pestilential constitution.

The causes, which give rise to that *local constitution* of atmosphere, favourable to the generation and propagation of pestilence, are by far more obvious in their nature, operate on a much less extensive scale, and possess an existence by no means so durable. They are principally confined to large cities, camps, and garrisons, where multitudes of people are crowded together, and where personal and other descriptions of cleanliness do not receive the attention they merit. They may be said, in general, to be, all such causes as tend, in the above descriptions of places, to generate foul air, and

thus produce a vitiated state of atmosphere. The principal of these shall hereafter become subjects of particular specification. This local constitution of atmosphere extends, frequently, beyond the immediate confines of cities, camps and garrisons, and, sometimes, even pervades considerable tracts of country, particularly such as are low and marshy. It is an evil, which may be said to owe its origin, in general, to that *indolence* and *inattention*, which unfortunately, constitute such predominant traits in the character of the human race. This peculiar constitution, of which we have spoken, is nothing else than a predisposition or capability in the atmosphere to generate and propagate pestilential diseases. It would seem to consist, either in the actual admixture of pestilential effluvia with the air which we breathe, or in the presence of some aeriform substance, which favours the existence and conveyance of such effluvia, and prevents their action from being destroyed by the influence of the atmosphere.

Your attention, for a few moments, is next solicited to the remote cause of pestilential diseases. It need scarcely be observed, that this subject is very nearly allied to that of which we have last treated. So intimate, indeed, is their connection, that they might, without any impropriety, have been both spoken of under the same head. This remote cause may be defined, a gas of a highly poisonous nature, which, when brought into contact with the human body, renders it liable, if exposed at the same time to the action of exciting causes, to an attack of the disease denominated pestilence.

A knowledge of the peculiar physical properties of this gas has hitherto remained, and, I fear, will very long continue to remain, an important desideratum in the science of medicine. Even the reality of its existence is, as yet, established, only, by its unparalleled ravages on the system of man, and on the systems of a few species of inferior animals. So extremely subtle and evanescent is its nature, that we have not been able to separate it from surrounding matter, to embody it together, and thus subject it to the test of observation and experiment.

A knowledge of the actual source of this pestilential vapour is equally interesting to physical science, and important to the welfare of the human race. Though it be possible that it may occasionally arise, in the form of exhalation, in consequence of the action of subterraneous fires; and though it be probable that it has, in some instances, been thrown from the bowels of the earth, during the convulsions of an earthquake, or the eruption of a volcano, yet these are by no means its most frequent sources. It appears to be now reduced to a certainty, as decisive as any existing in physical science, that organized bodies, in a high and long continued state of putrefaction, constitute the legitimate parent of pestilential effluvia.*

* I have not thought proper to attempt a minute detail of all the evidence that might be collected in favour of the above position. It is, by far, too extensive to be embodied within the necessary limits of my address. It may be found most copiously diffused through the works of all philosophical

That this is the case, we justly infer, from the circumstance of pestilence never raging, to an alarming extent, unless in situations where putrefaction goes forward on an ex-

physicians, who have written expressly on the subject of pestilence. A condensed statement of it here, would be nothing more than a needless repetition of what must be familiar to the mind of every one, who has attended to the cultivation of the science of medicine. Ever since pestilence was first acknowledged to be a native of our globe, it has been uniformly derived, by physicians of observation, from the poisonous gas resulting from the putrefactive dissolution of organized bodies. This would lead me to a few observations on the subject of poisons.

This destructive class of substances has been, generally, divided into the animal, the vegetable and the mineral, to which should be added, that much more formidable description of poison, derived originally from the process of putrefaction. Under these four denominations, are embraced all the species and varieties of poisons, that have hitherto attracted the notice of philosophers. That pestilential and infectious diseases are the result of poisonous effluvia, operating on the system of man, is a truth, to which medical characters have long given their assent. An interesting question would seem to arise here, namely, to what denomination of poisons, do these effluvia appear to belong? It cannot be supposed to be to the animal, the vegetable, or the mineral poisons, because these deleterious substances have never been known, nor even suspected, to be capable of propagating themselves. Thus, a person under the painful operation of an over-proportion of arsenic, or of opium, or agonized by the bite of the rattle-snake, is incapable of communicating his disease to any of his attendants. The same thing may be said respecting the morbid affections, resulting from any species of either of the three foregoing genera of poisons. I believe it to be a truth, that they have never been known to be, in any instance, communicable. The poison, therefore, giving birth to pestilential and infectious diseases, belongs to that genus, which derives its origin from the putrefactive process.

tensive scale. In turning over the annals of medicine, even from their earliest period, down to the present day, we will not find a single record of pestilence having prevailed

Putrefaction I would consider as a generic term, embracing several specific or at least various modes, in which organized bodies undergo dissolution, and recombination into gaseous results, some of them of a deleterious or poisonous nature. These poisonous results would seem to differ from each other, according to the varieties of the process by which they were produced. Thus for example, from one particular description or modification of the putrefactive process, or, if the reader be more pleased with the hypothesis, from the putrefaction of a particular description of matter, originated the poisonous effluvia or seeds of pestilence; from another, those of small-pox, from another, those of measles, from another, those of lues venerea, &c. From the foregoing principles it would appear, that all infectious diseases, as the small-pox and lues venerea, instead of being, as they have been generally supposed, the specific and exclusive growth of the East, the West, or of any particular climate or situation, may, under certain circumstances, originate in any inhabited portion of our globe. Nor do I consider our own country as by any means exempt from this general charge. I believe, that the small pox may originate in America or Europe, as well as in Asia, and that the venereal disease may originate in Asia or Europe, as well as in America. I am persuaded that the great and irreversible principles, by which, the decomposition and recombination of matter are governed, operate uniformly in all places, and that no spot on the globe is privileged with a special exemption from their influence.

I am aware, that, by some physicians, this note will be considered as nothing else than the mere child of fancy, or as the airy effusion of a speculative mind—Be it so—I will, however, most sincerely thank such solid and sagacious characters, to point out to me a more probable source of pestilential and infectious diseases, than the putrefactive dissolution of organized bodies!

and spread in places, where cleanliness has been attended to in all its branches. Whereas, on the other hand, most large cities, and even considerable tract of country, where putrefying filth has been suffered to abound, have repeatedly experienced this scourge in all its malignity. Thus the plague of Egypt, unquestionably derives its birth from the filth spread around by the waters of the Nile. The immensity of putrefying animal and vegetable substances, with which the streets and suburbs of Constantinople abound, afford origin to the pestilence, which so frequently visits that unfortunate city. And the Yellow Fever or plague of the West Indies, appears to be indebted, for its birth and existence, entirely to the extensive putrefactive dissolution of organized bodies, produced by the fervors of a topical sun.

From a similar source, namely, the filth of a crowded garrison city, must we deduce the celebrated plague of Athens, which, to the eye of fancy, seems still to live and rage with consummate malignity, in the descriptive eloquence of Thucydides : And to causes precisely similar, must we attribute that dreadful pestilence, which before the walls of Syracuse, made greater havoc among the Roman legions, than even the stupendous engines of Archimedes—To what causes, I would beg leave to ask, are we to ascribe the more frequent and general prevalence of pestilential diseases in camps, garrisons, and other places of military establishment ? Is it not to a want of cleanliness ?—To the immensity of putrefying filth, with which such places, for the most part, abound ? A want of cleanliness, and a

greater exposure of men to actual hardship and fatigue, are the two only circumstances, relative to health and disease, in which military situations differ materially from others. To these circumstances, therefore, are we bound to attribute the more frequent visitations of pestilence, to which such places are unfortunately subjected. The former of these, namely, a want of cleanliness, gives rise to the remote, and the other, viz. exposure to hardships, acts as the exciting cause of the malady. Let me me not, on the present occasion, fail to observe, that when pestilence breaks out in any place, it never fails to make its appearance about that period, when, from the usual co-operation of physical causes, the process of general putrefaction, has arrived to its summit.—Thus may pestilential effluvia be generated in every spot on the surface of the globe, where the soil gives birth to organized bodies, and the climate affords a sufficiency of heat and moisture, to give rise to a high putrefactive process. There exist numerous proofs, sacred, I had almost said, as those of holy writ, of pestilence having been the native growth of many places on the continent of Europe. Even beneath the frozen sky of Russia, has this Demon of putrefaction burst into existence, from domestic causes, and called up death and desolation, as the concomitants of his career. !

If the foregoing propositions and assertions be true,—and confident I am, they are such, as rest on a basis, no less secure than the experience and observation of ages, cemented by the fairest deductions of reason—If it be true,

I say, that pestilence can originate from the putrefaction of organized bodies in Europe, Asia and Africa, what shadow of reason have we to suppose America privileged with an exemption from a similar misfortune? Can we have the *vanity*—I might have said the *presumption*, to allege, that the God of a *general* providence has condescended to enact a law of *special* dispensation in favour of *us*, because we inhabit the western shore of the Atlantic? Has he, for us alone, laid aside his robes of Deity? has he, for us alone, stooped from the unaccommodating majesty of his character? has he forfeited his title, as the impartial ruler of the universe, and belittled himself by becoming a partizan on behalf of the continent of America?—Highly as I think of my native country, and proud as I am of my birth-right as an American, my patriotic fervor has not yet so far obscured my understanding, as to bear me out in a belief so irrational, and presumptuous! But to relinquish, for a moment, our views in theology, and address you in language more strictly philosophical.—Are the atmosphere, the waters and the organized productions of the new world, exempt from the government of the great physical principles, to the influence of which, those of the old are uniformly and necessarily subjected? Have we not, within ourselves, an immensity of the requisites necessary for carrying putrefaction to the highest stage? When advanced to such stage, will not this process produce, with us, the very same deleterious effluvia to which it gives birth in other quarters of the globe? And, when once evolved, will not this effluvia ge-

riate and propagate pestilence here, with as much readiness, and with as much malignity, as in countries situated beyond the Atlantic? To answer those propositions in the negative, would be to deny, that the same physical causes, when uncontrouled in their operation, will always be productive of the same effects. As well may we say, that the same animals which propagate their likeness in Europe, cannot in America; or that the same sun which wakes to life the sleeping blossom there, cannot rouse it from its wintry slumbers here!

Let not chemists, in the pride of their knowledge, deny, that pestilential effluvia can be the offspring of putrefaction, because they are unable to produce it in their laboratories. Let them remember, that they are not yet able to operate, in all respects, as nature does, nor are they possessed of any chemical tests to ascertain, with decision, where these effluvia do and where they do not prevail. Their effects on the human body constitute the only indubitable testimony of their existence; and these, as mentioned before, never occur to any extent, except in places abounding with substances in a state of putrefaction.

It may not be improper, on the present occasion, to observe, that of all animal substances, the matter of human perspiration is by no means the least liable to putrefaction. After its discharge from the pores of the body, it would seem to run, with much rapidity, into this offensive state. Nor is it the most innocent, in its nature, when under the

actual influence of this process. There is reason to believe, that, from the putrefaction of the perspirable gas, in places where numbers have been unduly crowded in small, unventilated apartments, diseases of a pestilential nature have resulted. But, unless when vitiated by means of putrefaction or actual disease, I believe the matter of perspiration to be perfectly unnoxious.

The relationship between the *American pestilence*, the *yellow fever*, or *pestilence of the West Indies*, and the *plague of Asia*, shall now constitute the subject of a few remarks.

From all the information I have been able to collect from observation, books, or conversation, respecting those three diseases, I have not been able to perceive that there exists between them any radical or essential difference. They seem evidently to originate from the same source, they are alike influenced by the usual vicissitudes of the seasons, they invade the human system in the same manner, and are characterized, in their course, by the same train of general symptoms. They appear, in fact, to be the very same disease, modified, to a certain degree, by various causes, of which the most powerful is that of *climate*. This is, indeed, a cause, the operation of which but few things are able to resist. It is well known that climate possesses a power of changing the aspect of plants, the appearance of inferior animals, and even the figure, complexion, and countenance of the human race. Thus, how different, in all these respects, is the appearance of an Asiatic from that of a native of Africa,

of Europe or America? May we not then, very rationally conclude, that the same cause, which possesses such an immense influence over plants and animals, is, in like manner, fully competent to the modification of disease? I will venture to affirm, that there exists a much greater difference between the general appearance of an Asiatic, and that of an American, than between the symptoms and progress of the American, and those of the Asiatic pestilence. But the men of Asia and America are held to be nothing more than varieties in the human race, resulting from a difference of climate and of the state of society. When any inconsiderable difference, then, is discovered in the general appearances of the pestilential diseases, by which the two countries are occasionally invaded, it may doubtless be attributed to the same causes.

With regard to the pestilence of the West Indies, it might, at first sight, appear to be, in one respect, very materially different from the other two. Thus, we learn from physicians, on whose report we may, most confidently, rely, that the former disease is never, in any instance, known to be contagious, whereas there is, perhaps, reason to believe, that the case is different with respect to the two latter. That they are occasionally propagated by contagion, is a position, to the truth of which physicians of the highest eminence have, at all times, afforded the testimony of their assent. On farther reflection, however, it will be immediately perceived, that this trait in the character of the West

India pestilence results entirely from the influence of a tropical climate. For it is a fact, well known to physicians of experience and information, that a high and uniform temperature of atmosphere, is decidedly hostile to the communication of pestilential diseases. Such a temperature, continued for some time, arrests the progress of even the desolating pestilence of Asia. It is a truth, which must be alike familiar to you all, that, at Constantinople, the summer no less than the winter solstice bestows on the inhabitants a temporary respite from the ravages of that dreadful calamity.—As, then, the men of Europe, Asia, Africa and America, are held, by our most eminent philosophers, to belong to the same species, and to owe the diversities in their appearance, principally, to the influence of climate and manner of life, would not a similar observation appear to be admissible, with respect to the pestilential epidemics of those four divisions of the globe? May not these diseases be, very rationally, viewed as the same in their nature, variously modified by climate, and by the habits and manners of the human race?

From subjects of speculation, let us now turn our attention to an object, which claims, from its situation, the solicitude of us all. Let us look around on Philadelphia, which has so lately exhausted the cup of calamity, and whose agonies, from the bitter draught, no friendly opiate has yet entirely lulled to rest.—Let us, I say, survey this opulent mart, this once fair and flourishing metropolis, and say, can it, or can it not, from causes within itself, give

birth to a genuine pestilential disease? To you, gentlemen, who have considered the matter with so much deliberation, I need hardly observe, that on the just decision of this question, and the subsequent measures established thereon, depends little less than the future existence of our city. It merits, therefore, the most profound attention of every American, who is a friend to his country, or who wishes well to the interest of the human race.

The subject of the origin of our late and preceding epidemics, has been already so amply discussed, that those who take it up, at this period, can be considered as little else than gleaners in the field of controversy. I cannot, however, close my address, without laying before you the following remarks. To strike, by their novelty, is not my intention, because I am sure they are already familiar to you all. To gain your assent to their truth and justice, constitutes, at present, the height of my ambition.

I. Considerably remote from the breezes of the ocean, and standing on a site of but a moderate elevation, Philadelphia is by no means favourably situated for free ventilation. These disadvantages, co-operating with those of numerous, lofty, and crowded buildings, produce a stagnation in the air of most parts of the city, unknown in places exempt from such obstructions. This stagnation is very sensibly, and even oppressively, experienced, by our citizens, during the warmth of the summer months. It is unnecessary to observe, that an atmosphere, such as this, is in a fit state

for the reception and retention of noxious effluvia. Nor does it, under this evident want of motion, appear, by any means, well calculated to dilute or weaken such effluvia, and thus obviate their pernicious influence on the human system.

II. Philadelphia, though situated in the latitude of forty, is, notwithstanding, annually subjected to all the fervors of a tropical climate, for the successive space of, at least, eighty or ninety days. Suffering, during this lengthy period, a heat superior, by three or four degrees, to that of the surrounding country, it may be considered as a perfect hot-house, with regard to generating and fostering the seeds of pestilential disease. Granting, therefore, that pestilence is the more native offspring of a tropical sky, and that it is even incapable of springing spontaneously beneath the natural temperature of a milder climate, yet still, may it rise and flourish luxuriantly in the hot-bed of a city as large and populous as that of Philadelphia. Thus, the plants of the tropics are reared in hot-houses by the curious, beneath the highest and most rigorous latitudes inhabited by man. In like manner may pestilence, (though possibly the more natural product of a tropical climate,) be reared to perfection in the hot-bed of Philadelphia.

III. The two evils, which I have just specified, are, in some measure, necessarily attendant on our unfortunate city. Though, by wisdom and industry, they may be diminished, to remove them, entirely, is beyond the limited powers of man. Their foundation is laid in the works of na-

ture, and art is, therefore, incompetent to their removal. Its utmost extent is to obviate the mischiefs which they tend to produce. We cannot countermand the excessive heats of our climate, we are unable to elevate the ground on which Philadelphia stands; nor can we invoke, with effect, the breezes of the Atlantic, to shed refreshment through our oppressive streets !*

Another evil remains yet to be mentioned, very different, in its nature, from the preceding two. It is altogether of artificial birth, and art and industry are, therefore, competent to its extinction. I allude to the immensity of filth, with which the different parts of our city and suburbs abound. Nor is this an evil of inferior magnitude. It may be considered as the hydra, whose malignant breath, gave birth to the calamities we have three times suffered. The feverities of the season have paralysed it, for the present, and reduced it to its customary state of hybernation. But unless prevented, by an adoption of the most wise and energetic measures, there is but too much reason to apprehend, that it will be again awakened to life and action, by the returning warmth of the summer sun ! Before the arrival of that eventful period, may some favoured champion—some

* *Notwithstanding the above observations, I am persuaded, that, by a due attention to domestic cleanliness, co-operating with such port regulations, as will prevent vessels containing foul air from entering our harbour, the city of Philadelphia may be rendered as perfectly exempt from pestilential epidemics, as any commercial city in the world.*

enterprising Hercules arise, and strike from existence this insatiate monster !

In taking a survey of many parts of our city and suburbs, our senses are struck by the offensive and dangerous spectacle, of an accumulation of the filth of nearly a century. In passing, in several directions, to a considerable distance from the pavements of our streets, we are not even suffered to tread on the soil of nature. We travel over artificial ground, made up of a fermenting assemblage of the most noxious materials. Here, to the depth of several inches beneath the surface, is promiscuously blended together, animal and vegetable matter, in a state of high putrefaction, while the same substances, in a similar state, are most plenteously strewn over the surface itself. Nor is moisture wanting to give vigour to the process.—During the excessive heats of our summer solstice, what, I would ask, must be the effect of the poisonous exhalation, arising from so extensive a source, added to that proceeding from numerous other domestic causes ? Must it not be, (to use the language of the poet,) the conversion of the whole atmosphere of our city into a “ foul and pestilent congregation of vapours ?” During this portentous feed-time of pestilence, we are not privileged to breathe the untainted air, prepared for our systems by the operations of nature, but are obliged to inhale a mixture of deleterious exhalations, proceeding from the indolence, ignorance, and inattention—I had almost said, from the criminality of man.—Nor is the experience of time devising measures for the re-

removal of this enormous evil, nor erecting any barriers to check its growth. Even the melancholy reverse of this is true. Notwithstanding the numerous declarations we hear, in favour of the cleanliness of our streets, at present, compared to what existed some years ago, it is an unquestionable truth, that, in the existing state of things, as year succeeds to year, the aggregate mass of filth in our city and suburbs encreases.* Should our civic police, (as far as it respects the prevention of disease,) continue supine and feeble, as it is, at present, what a dark and gloomy prospect is opened to our view ! With the future progress of time, danger would seem to accumulate on danger, and distress to blacken over distress, till imagination becomes bewildered, in attempting to calculate the melancholy result.

Owing to such a state of domestic filth, as now prevails in and around the city of Philadelphia, was the plague, in former times, the scourge of London, and other populous cities of Europe ; and, owing to a similar state, does it still

** The filth taken up from our streets, not excepting even that which is removed from our necessities themselves, is, at present, conveyed to such an inconsiderable distance from the city, that it might almost as well, be suffered to remain in its original situation. Instead of employing such materials for filling up ponds, and levelling the ground, in the south-western part of the city, would it not be much more wise and economical, to convert them to the purpose of fertilizing the ground, under cultivation in the neighbourhood, where, instead of proving destructive to the life of man, the effluvia which they emit, might contribute, to rear up vegetables for his sustenance and comfort ?*

continue, occasionally, to rage in Constantinople, and in many other devoted places in the East.

However painful the prospect, and however unpopular the idea, may, at present, be with many, it is, in my apprehension of things, a truth which ought not to be forgotten, that unless the misfortune be averted, by the most vigilant and energetic measures of domestic cleanliness, the the large commercial cities of America will, in, perhaps, less than a century, become as remarkable for giving birth to pestilence, as any ever have been in Europe, or as any are now on the continent of Asia.

To enumerate all the sources of our domestic filth, is not my present object. This has already been ably done, in several memorials from the Academy of medicine. There exist, however, two sources in particular, to which, I will be pardoned for thinking, that the public attention has not been directed, in a manner sufficiently forcible. These are; the vast quantity of putrid and putrefying timber, which enters into the formation of our docks and wharves, and the immensity of animal and vegetable substances, strewn, in a putrefactive state, along the commons, in a south-western direction from the city.

From the former of these sources, an incalculable volume of deleterious air must be discharged, to the great annoyance of the crews of vessels in our harbour, and of all whose business demands their attendance along shore. For this evil the remedy is easy and obvious. The timbers ought to

be removed, as much as possible, from the docks and wharves, and their place supplied by brick or stone.

From the latter source, namely, the abundance of putrifying substances, dispersed over the commons, in a *south western* direction, the air of the city must be deeply contaminated. To have a due sense of the propriety and weight of this observation, it is necessary to recollect, that, particularly, during the months of July, August, and September, our prevailing winds are from that quarter. Whatever noxious effluvia, therefore, may be evolved from those substances, by the process of putrefaction, is wafted, immediately, into the heart of our city, and mingled with the air of the streets which we breathe. There is certainly reason to believe, that, to these effluvia, we were indebted, in no inconsiderable degree, for that local constitution of atmosphere, so highly favourable to the propagation of our late epidemic.

It is scarcely necessary to observe, that the remedy for this evil is the immediate and entire removal of the offensive substances. If the places, which those matters now occupy, were planted with trees or shrubbery, or, even, put under a crop of inferior vegetation, the effect, on the city, would be both pleasant and salutary. Vegetables are known to emit, during their wakeful and active state, large quantities of pure respirable air. Were the above regulation, therefore, adopted, instead of the offensive and pernicious vapour of putrefaction, this fluid of life, would,

in consequence of the south-western winds of summer and autumn, glide through our streets, and diffuse both health and vigour from its wings.

To the two preceding sources of the vitiation of our atmosphere, let me not omit to subjoin that which is constituted by our public burying grounds. To a mind eying, with deep solicitude, the apparently dubious balance of fate, with respect to the future prosperity of our city, these extensive reservoirs, fraught with the mouldering reliëts of the dead, present themselves, as objects of painful apprehension. They appear equally *melancholy* and *dangerous*, and, in neither respect, is the degree inconsiderable. Situated, as some of them are, in the very centre of our city, these spacious inclosures, a great part of the soil of which, is composed of human exuvæ, cannot do otherwise than aid in contaminating the air of our streets, and the water of our pumps. That the water of our city is injured, by the immensity of dead bodies, deposited in our grave-yards, we would infer, from the very considerable distance, to which the putrid effluvia, from the contents of a grave, have been known to make their way, through the bowels of the earth. And, that the same cause, has a tendency to vitiate our atmosphere, we would conclude, in particular, from certain physical phenomena, for which ancient grave-yards have been always remarkable. The phenonema, to which I allude are, a kind of burning meteors, that sweep along the surface of the ground, and which are known, under the vulgar denomination of Will-with-the-wisp, or Jack-with-

the-lantern. These would seem to owe their existence, principally, to an inflammable gas, discharged, through the pores of the earth, from the putrefying contents of the graves, and have, probably, aided much, in giving origin to the superstitious legends of the ignorant, respecting church-yards being haunted, by goblins and ghosts.

For this evil, I need hardly observe, that the only remedy is, the removal of our burying grounds, to a distance from the city. Nor let an attachment and veneration, however natural and amiable, for the reliëts of our friends, prevent the adoption of such a salutary measure ! If we painfully feel and deplore the loss of our *friends deceased*, why dispose of their bodies, in such a way, as to sow the seeds of pestilence and death, among those that survive, and thus, voluntarily, subject ourselves to additional sorrow ? To a feeling and reflecting mind, it is, doubtless, a much more eligible alternative, to have a portion of our relatives and friends still living, and those that are dead, buried in a distant situation, and, even, in what some might consider as unhallowed ground, than to have them all swept off, though buried in the immediate vicinity of our dwellings, and in ground duly consecrated for the purpose of interment.

On taking the preceding general view of the situation and circumstances of Philadelphia—On considering it as a large and populous city, deprived of the advantage of free ventilation, subjected, during the summer months, to a heat equal, at least, to that of the tropics, and enveloped,

during that period, in a cloud of poisonous exhalation, from the putrefactive dissolution of organized bodies.—On maturely weighing, I say, the foregoing considerations, and, at the same time, recollecting, that, under similar circumstances, pestilential diseases have, unquestionably, arisen in other places, what shadow of reason have we to doubt the practicability of pestilence originating in our city, from domestic causes alone? As well may we assert, that the same sun, which promotes vegetation, in the eastern, has no such influence in the western hemisphere, as deny to causes, which are known and acknowledged to give birth to pestilence, in the cities of Asia, the power of producing the same disease, when operating, with equal force, in the cities of America. Could I be persuaded, that, under similar circumstances, the same causes, do not, uniformly and necessarily, produce the same effects in Asia and America, I would, immediately, subscribe to the Pagan belief of Polytheism. In such a state of things, I would be constrained to believe, that the God of the old world, was not, in like manner, the God of the new, but that the two hemispheres of our globe, were governed by distinct Deities, through the medium of different physical laws!

I have, hitherto, treated my subject in a manner rather abstract and general, and have indulged myself, occasionally, in discursive speculation. I have endeavoured to demonstrate, on principles long since known and established, the practicability of pestilential diseases originating on the western shores of the Atlantic. From general reasoning,

I might now descend to particular specification, and exchange principles in science, for plain and undeniable matters of fact. Thus, might I advert to the history of a far distant period, and shew, from authentic records, that, previously to the establishment of any commercial intercourse, between America and the West Indies, even the depth of our forests were unable to shelter the aborigines of our own country, from the invasion of pestilence. I might point to our extensive north western lakes, and the country adjacent, where pestilential epidemics not unfrequently prevail with high malignity, and where, at the same time, foreign intercourse is altogether unknown. But leaving former times, and remote places, I might proceed to shew, that, within a few years past, and, in places not far distant, numerous instances of the American pestilence have appeared, which could not possibly be traced to any communication with a foreign climate or infected source, and which must have, therefore, originated in the very places where they occurred. But I am precluded, from a more extensive view of my subject, by an unwillingness to intrude any farther on your time, and, thus, be guilty of an undue trespass on your politeness and indulgence.

Before concluding my address, allow me, Gentlemen, to congratulate you on the success, I had almost said, the *triumph* of the principles, which the Academy advocates, respecting the origin of the late epidemics of America. To say, that these diseases are of domestic growth, is no longer denounced as medical heresy, nor as a species of blasphemy against our

country. On this subject, the shades of *prejudice* and *error* are rapidly retreating, before the radiance of *liberality* and *truth*. As far as relates to the necessary importation of pestilential diseases from foreign countries, the time-worn fabric of superstition in medicine, has received a revolutionary blow, from which it is tottering to the depth of its foundation! Nor is the time far distant, when this humiliating monument of the bigotry of ages, shall tumble to irreparable ruins around the *boary** heads of its supporters.

Persevere, then, my fellow-members, to the completion of the work you have so laudably undertaken. Wage for yourselves, both jointly and individually, nothing less than a war of utter extermination, against those prejudices and errors, which threaten the depopulation of the cities of

* Of those physicians, who advocate the opinion, that the disease, in question, is necessarily of foreign origin, there are but very few, who are not considerably advanced in years. This, on first view, might appear to be an evidence, of some degree of respectability, in favour of the authenticity and truth of the opinion. The force of this evidence, however, will be much diminished, when we recollect, that almost the only medical characters, in Great Britain, who opposed the truth of Harvey's discovery of the circulation of the blood, and blindly adhered to the antiquated and absurd error of its flux and reflux through the same channels, were such as had, at the time of the discovery, passed the fortieth year of their age. On the death of those characters, all opposition to the Harveian doctrine ceased. Such will be the fate of the doctrine which embraces the domestic origin of the pestilence of America. Our medical posterity will unanimously adopt it, nor will they fail to wonder, why it was rejected by any of their ancestors.

America. While thus engaged, whatever may be the fate of your reputations, with a few of your narrow minded cotemporaries, be assured, that, if you continue firm in the track, where *philanthropy* leads and *science* lights the way, you will not—you cannot fail, to receive the approbation and applause of a more enlightened and grateful posterity!

E N D.

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